



MATH for-ce







Ellen McPeek Glisan, PhD



























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Add and Subtract





Looking at Life: The Mathematics of Basketball

Keeping score is just one of many ways numbers are used in the game of basketball. Game statistics, often called *stats*, are another way that numbers are used.

Game stats tell a story about what each player did during the game. Stats include information such as each player's number of baskets made, fouls committed, and time played.

Some basketball stats require the skills of adding and subtracting.

WHAT DO YOU THINK?

What is one reason that a basketball coach would add or subtract?										



SKILL REVIEW

Adding is putting together. Subtracting is taking away. To add and subtract, you need the following skills:

SKILL 1 Learn addition and subtraction facts for single numbers.	4 + 2 = 6 6 - 2 = 4	
SKILL 2 Add larger numbers in rows and columns.	COLUMNS $ \psi \psi $ $ 22 $ ROWS $ \frac{+37}{59} $	
SKILL 3 Subtract larger numbers in rows and columns.	59 <u>- 22</u> 37	
SKILL 4 Add numbers with carrying.	You carry when a column adds up to 10 or more.	19 + 1 20
SKILL 5 Subtract numbers with borrowing.	If a bottom number is bigger than a top number, you borrow from the next column.	20 <u>- 19</u> 1

GET THE FACTS: Zero and One

ZERO (0) is the same as nothing.

Any number + 0 is the same number: 8 + 0 = 8

Any number – 0 is the same number: 8 - 0 = 8

Any number minus the same number is always **zero**: 8 - 8 = 0

ONE (1) plus or minus any number goes to the number right next to it.

Any number + 1 is the very next number: 1 + 4 = 5 4 + 1 = 5

Any number – 1 is the number just before: 5-1=4 4-1=3

Try it! 7 + 0 =____ 7 - 0 =___ 7 - 1 =____



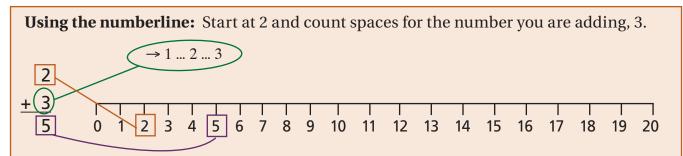
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SKILL 1

Addition Facts: Single Numbers

Learn the basic facts for the numbers 0 to 10. At first you might use a **numberline** to count, but if you practice you will know math facts without counting.

For basic addition facts, you put together two numbers between 0 and 10. Example: ± 3



It's Your Turn: Complete these addition facts. If you need to, you can use the numberline. See if you can do the top row in your head. What about the bottom row?

	Т	Т					Т			\Box	\top	\top	\Box	Т	\Box	\Box		\Box		\neg
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

Hint: See the facts about Zero and One.

1	4	1	6	3
+ 3	+ 0	<u>+ 8</u>	<u>+ 0</u>	+ 2
8	8	6	6	9
+ 3	+ 4	<u>+ 6</u>	<u>+ 7</u>	+ 9



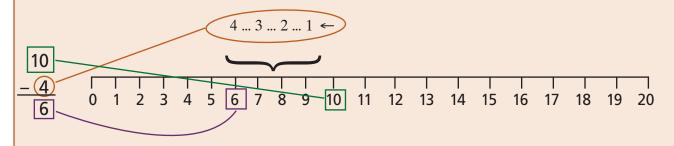
Subtraction Facts: Single Numbers

Learn the basic facts for the numbers 0 to 10.

For basic subtraction facts, start at the top number and count backwards the number of spaces equal to the next number.

Example:
$$\frac{-4}{6}$$

Using the numberline: Start at 10 and count spaces backwards for the 2nd number, 4.



It's Your Turn: Complete these subtraction facts. If you need to, you can use the numberline. See if you can do the top row in your head. Then try the bottom row.

Remember the facts about 0 and 1!

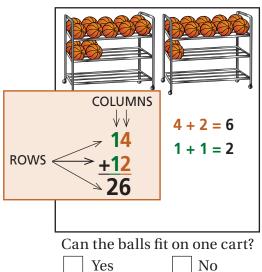
6	3	15	20	7
<u>- 1</u>	<u>- 0</u>	<u>– 1</u>	<u>– 10</u>	<u>- 2</u>
9	6	8	9	8
<u>- 3</u>	<u>- 5</u>	<u>- 2</u>	<u>- 8</u>	<u>- 6</u>

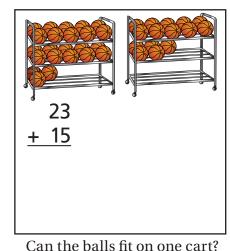


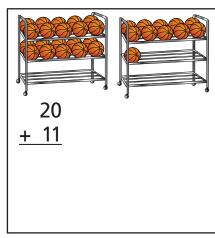
Add Larger Numbers

Larger numbers have two or more columns. Each column is a simple addition fact. Start with the column on the right, then go to the left.

Each cart below can hold 30 basketballs. Use addition to see if the balls on each set of carts could fit on just one of the carts.







Yes

No

Can the balls fit on one cart?

Yes

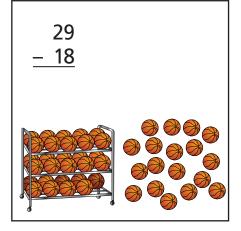
No

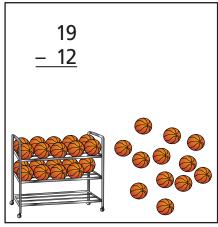
SKILL 3

Subtract Larger Numbers

Larger numbers have two or more columns. For each problem, start with the column on the right.

Each cart below shows the number of balls at the beginning of practice. The loose balls shows the number that were used. Use subtraction to find out how many balls were not used.







Add Numbers With Carrying

When the numbers in a column add up to more than 9, you need to use carrying. Write down the righthand number, and carry the leftover numbers to the next column over. Always go right to left. See "How To Do It" below, then try it!

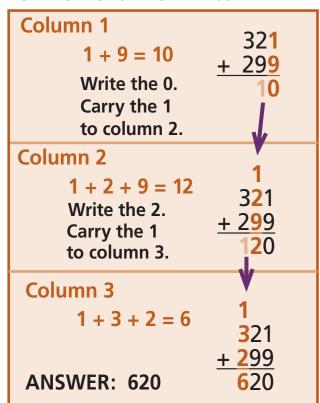


GET THE FACTS: Using a calculator

Sometimes you will use a calculator. It is a good idea to learn how to add and subtract big numbers without one. While you are practicing, you can use a calculator to check your answers.

Maddie is gluing dried peas onto her artwork to make trees. Some peas are already glued in place. She plans to add the loose peas. Find the total number of peas she will use for each tree. Start with the righthand column, and add all three columns.





Now You Try It! 245 + 207 = X



Subtract Numbers With Borrowing

When at least one of the bottom numbers is bigger than the number above it, you need to use borrowing. Cross out the number at the top of the next column to the left, make it one less, and put "1" in front of the number that was too small.

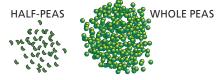
For each problem, start with the righthand column. See examples below.

EXAMPLE: 45 - 29 = X

Start with 5-9. 5 is smaller than 9, so go to the next column. Take 1 away from the 4 and put it in front of the 5. Now 5 is 15. 15-9=6. Going left, 4 is now 3. 3-2=1. Answer: 16.

15	3
45	45
<u> </u>	<u> </u>
6	16

Maddie started with two piles of peas for her trees. Each pile had some peas that were split in half. She sorted out the half-peas. How many whole peas are left?



How To Do It 432 - 29 = X



Take 1 from the 3, put it in front of 2 to make 12.

$$12 - 9 = 3$$

Column 2

Now the 3 is a 2.

$$2 - 2 = 0$$

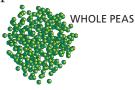
422

Column 3

ANSWER: 403

432





Now You Try It! 387 - 91 = X

Column 1

TIP: Only borrow when the top number is smaller than the bottom number.

Column 2

Column 3

387 - 91

ANSWER:





Iris, Odell, and Stats

"I'll collect the dirty towels if you wash the player's bench," Iris said as she grabbed a towel.

"Such fun tasks we have," laughed Odell. He picked up the spray bottle and headed into the gym.

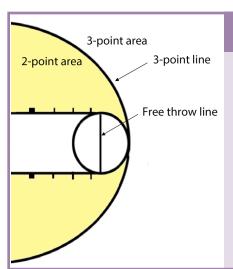
Aside from a few after-game clean-up chores, Iris and Odell enjoyed being the managers for the basketball team. Coach Samantha Maverick trusted them with a lot of tasks. Their favorite chore was making statistic charts. Using the spreadsheet was fun. They also liked seeing how the players were doing.

Odell walked back in the locker room just as Iris picked up the last towel. They stopped in the coach's office to say goodnight.

"Hey, guys!" Coach Maverick said with a smile. "You two did a great job tonight. How would you like to come in tomorrow afternoon and make some new statistic charts? I'll buy pizza."

"I can," said Iris.

"Me, too!" answered Odell.



GET THE FACTS: Scoring

In the game of basketball, players can score in three different ways.

- Shoot the basket through the hoop while playing near the basket: 2 points
- Shoot the basket through the hoop while playing behind the three-point line: 3 points
- Shoot the basket from the freethrow line after a referee calls a foul on a player from the opposite team: 1 point per shot





"Great, I'll see you about 1:00," Coach Mayerick said.

"See you then," Iris and Odell said together.

When Iris walked into Coach Maverick's office the next day at 1:00, Odell was already sitting at the computer. "How long have you been here?" Iris asked.

"I just got here. Coach Mav already had the computer on," Odell answered. "I was looking at the scores for the last four games. Our Wildcats have been doing great!"

Just then, Coach Maverick walked in with a hot pizza. "Hi guys. Thanks for coming. I've got the stats tallies for the last four games. Tallies are the marks I made to keep track of our scores. I would like you two to use the information to create a team chart that

covers all four games. Start by changing the tallies from the first game into numbers." She gave Iris and Odell the first chart.

"The other games were done in a hand-held computer and I will get those printouts for you. You will need to add the total points for each player to get the total points for the team."

Iris looked at the chart, then she asked, "Coach Maverick, am I right that the tally marks in the attempted column mean all baskets shot, both made and missed?"

Coach Maverick answered, "Yes, that is correct." Then, she continued, "We are going to have a Most Valuable Player. I want my players to avoid breaking the rules, so subtract any fouls they made from their total points."



"After you finish the most-valuable chart, I'll take the top three choices from your chart. The players can then vote on one of the three to be the Most Valuable Player," Coach Maverick explained as she walked out the door.

Iris and Odell worked all afternoon. Before they left, they put the finished charts on Coach Maverick's desk.

Just as they were leaving, Coach Maverick came back. She picked up the top chart and said, "This looks great, guys. Thanks for all your work."

It's Your Turn: Count the tally marks in the chart below and write them down as numbers. The first row is already done. Four lines with a line through them, like this | is 5. If there are no tallies, write a zero: 0.

Diavore	2-point ba	skets	3-point ba	skets	Free Throws			
Players	attempted	made	attempted	made	attempted	made		
Kopper	WII WII II		Ш					
Kaydra								
Jackie	ШП							
Tonya	ШП	I						
Abigail	HHI HHI			П		П		
Brae Lynn	ШП							

Dlayers	2-point bas	skets	3-point ba	skets	Free Throws		
Players	attempted	made	attempted	made	attempted	made	
Kopper	12	3	3	1	2	1	
Kaydra							
Jackie							
Tonya							
Abigail							
Brae Lynn							



GET THE FACTS: All About Stats

In this story the coach is tracking the points scored by individual players and by the team. In real life, coaches keep track of many other things that their players do.

- Foul: Hitting, bumping or tripping a player on the other team (bad)
- **Rebound (Reb):** Getting the ball after it hits the hoop (good)
- Assist (Asst): Passing the ball to a player who then scores (good)
- Steal (Stls): Taking the ball from the other team (good)
- Turnover (TOV): Losing the ball to the other team (bad)

Here's an example of a real-life basketball score sheet.

	Tea	m Na	me		1	Be	2	60	ea	さ	5		-	lome	- 1	Da	te		12/	30	Gyı	m	Ce	ntral	J4/5
Te	am	l st Half	1	ş	3	4		5	6	Во	nus	₹	8	9		Double Bonus	_	10	Tin	ne	На	lf	:30	:30	
Fo	uls	2nd Half	٨	2	3	¥		5	6	Во	nus	7	8	9		Double Bonus	_	10 +	Ou	ts	Fu	II	¥	¥	F
#		Playe	r		F	ou	ls		lst	t Q	2n	d Ç	5	3rd	Q	4th Ç	2	Reb	Asst	Stis	TOV	FC	3 %	FT%	Pts
2	u)i/50	on	1	. 1	3	4	5	6	ا, 🧿	3,.	2		0	0	3,26	9	111		N	×	2,	16	2/3	6
5	P	arke	21	,	×	3	4	5	3					2,2	?	00)	##	\	\	//	V	/3	2/2	5
10	5	mit	4	χ	2	3	4	5			2,	0				2,26	9,	##11		"	\	2,	15	0/0	4
<i>2</i> I	Jo	hns	0	, 1	×	3	4	5	ارا		0	ı		3,2	3	2,0	2	\	//	##	##	4/	17	0/2	9
24	W	illia	m	5 7	2	3	4	5	0		4	0)	3,6	3	2,0	1	##	##	//	\	2,	14	4/4	9
38	.5	izz	0	١	*	3	4	5	0		2,	2				2,2		\		\		ν	15	0/0	2
55	0)`Ne	<i>i/</i>	١	2	3	4	5	2,	3	6	0)	2,2	?	00	,ı		111	\	"	2,	16	0/0	6
				Sho	ts F	G /	/ F	GA	4/	16	3,	/8		2/	9	5/1	3					14/	/36	8/11	
							Tot	als	4	7		9		8		15		22	П	13	12	3	9 %	73 :	41
Run	ning	Scor	e																						
¥	<u>}</u>	3	'n	5.	\		አ	1	R	Ď	6	I\	Т	12	1/3	14	۸c	16	17	e No	20	51	22	33 /	24 25



THINKING IT OUT #1: Player Charts

DIRECTIONS: Add up Kopper's points for each game. Game 1 has been done. Then add the points at the bottom to get Kopper's total number of points. Do this for all the players.

How to do it: Add together Kopper's points from Game 1, Game 2, Game 3, and Game 4. Put the **TOTAL POINTS** for each game in the green blanks. Then add the numbers.

Remember: If a column adds up to 10 or more, carry the extra number to the left. After Kopper's chart, do charts for Kaydra, Jackie, Tonya, Abigail, and Brae.

Kopper	Game 1 points	Game 2 points	Game 3 points	Game 4 points			
2-pt shots	6	0	2	4			
3-pt shots	3	3	0	3			
Free throws	1	0	0	1			
TOTAL POINTS	10						
Total Gam	ne 1 points	10	WORKSPACE				
Total Gam	ne 2 points						
Total Gam	ne 3 points						
Total Gam	ne 4 points						
FINAL TOT	AL POINTS						



Brae	Game 1 points	Game 2 points	Game 3 points	Game 4 points
2-pt shots	4	0	2	2
3-pt shots	0	0	0	0
Free throws	0	0	0	0
TOTAL POINTS				
Total Gam	ne 1 points		WORK	SPACE
Total Gam	ne 2 points			
Total Gam	ne 3 points			
Total Gam	ne 4 points			
FINAL TOT	AL POINTS			

THINKING IT OUT #2: Most Valuable Player

DIRECTIONS: Copy each player's FINAL TOTAL POINTS to the "Points" row below. Subtract the number of fouls from the number of points to get the players' final score. The coach is going to let the team choose from the three players with the highest scores.
Who are the top three?
Look at FINAL SCORE. Who is the most valuable player?

	Kopper	Kaydra	Jackie	Tonya	Abigail	Brae
Points						
Fouls	- 12	- 8	– 18	- 0	– 15	– 5
FINAL SCORE						



THINKING IT OUT #3: Team Chart

DIRECTIONS: Add the players' points for each game together to figure out the team's points. How does it compare with the Wildcats' final scores in the box below?

Then, add the numbers in the righthand column together to figure out the team's total points for games 1 through 4.

PLAYER	GAME 1	GAME 2	GAME 3	GAME 4	GAMES 1-4
Kopper	10	3	2	8	23
Kaydra	4	10	14	16	44
Jackie	5	12	12	18	47
Tonya	2	12	14	8	36
Abigail	14	16	5	15	50
Brae	4	0	2	2	8
TEAM POINTS PER GAME					

BONUS: If you add the numbers in the bottom row, the team points for games 1 through 4, what will that number be? Try it!

Wildcats Final Scores

GAME 1: Racers 44, Wildcats 39

GAME 3: Wildcats 49, Sharks 24

GAME 2: Wildcats 53, Badgers 40

GAME 4: Wildcats 67, Miners 51

LIFE SKILLS WORKSHEET #1



Figuring Ages

Directions: Find each person's age.

#	Name	Current Year	Year Born	Calculation	Age
Sample:	Carrie	2007	1995	2007 - 1995 = 12	12 yrs old
1.	Adam		1992		
2.	Beth		2003		
3.	Nettie		1955		
4.	Ching Yu		1967		
5.	Craig		1982		
6.	Marcos		1975		
7.	LaFrancine		1998		
8.	Sam		2005		
9.	Del		1961		
10.	LeBron		1980		

LIFE SKILLS WORKSHEET #5



Working with a Bus Schedule

Directions: Use this early-morning airport bus schedule to answer the questions.

From BURIEN, WA to Sea-Tac Airport (Weekday):

S 2nd & Burnett Av S	S Grady Way & Shattuck Av S	Tukwila Station	Andover Pk W & Baker	Sea-Tac (Bag Claim) Bay-2	4th Av SW & SW 150th
5:34am	5:40am		5:50am	6:04am	6:16am
			5:50am	0.00.000000	0.1-0.00
5:54am	6:00am		6:10am	6:24am	6:36am
6:05am	6:12am	6:18am	6:22am	6:36am	6:48am
6:19am	6:26am	6:32amB	6:36am	6:50am	7:02am
6:35am	6:42am	6:48amB	6:52am	7:07am	7:20am
6:50am	6:57am	7:03amB	7:08am	7:23am	7:36am
7:03am	7:11am	7:18amB	7:23am	7:38am	7:51am
7:17am	7:25am	7:33amB	7:38am	7:53am	8:06am
7:32am	7:40am	7:48amB	7:53am	8:08am	8:21am
7:48am	7:56am	8:04amB	8:09am	8:24am	8:37am
8:05am	8:12am		8:23am	8:38am	8:51am
8:20am	8:27am		8:38am	8:53am	9:06am
8:35am	8:42am		8:53am	9:08am	9:20am
8:50am	8:57am		9:08am	9:23am	9:35am
9:05am	9:12am		9:23am	9:38am	9:50am
9:20am	9:27am		9:38am	9:53am	10:05am
9:35am	9:42am		9:53am	10:08am	10:20am
9:50am	9:57am		10:08am	10:23am	10:35am
10:05am	10:12am		10:23am	10:38am	10:50am

1.	About how long does it take to get from S. 2nd and Burnett Ave. S. to the airport baggage claim?
2.	What time should you get on the bus at S. Grady Way if you want to be at 4th Ave SW by 8:45?
3.	If you are getting on the bus at Tukwila Station, and you need to be at the Bay-2 at the airport by
	9:38, what is the latest time you can get on the bus?
4.	Say you have a flight at noon and you want to be at the airport two hours before your flight.
	What is the latest bus you can catch at Andover Pk W & Baker?
5.	Say you board the 6:35 A.M. bus at S. 2nd & Burnett Ave. S., and your flight is at 9:00.
	If you get off at Baggage claim, how mcuh time will you have before your flight?

PRACTICE Add & Subtract



Addition Facts: Single Numbers

2	5	1	7	4
+ 3	<u>+ 9</u>	<u>+ 9</u>	<u>+ 6</u>	<u>+ 6</u>
8	8	6	6	7
+ 3	<u>+ 4</u>	<u>+ 2</u>	+ 3	+ 3
1	2	3	4	5
+ 1	+ 2	+ 3	+ 4	<u>+ 5</u>
6	7	8	9	9
+ 6	+ 7	+ 8	+ 9	<u>+ 6</u>
8	7	8	8	7
+ 7	+ <u>5</u>	+ 9	+ 6	<u>+ 6</u>

PRACTICE Add & Subtract



Subtraction Facts: 1 through 20

3	9	9	8	7
<u>- 1</u>	<u>- 5</u>	<u>- 1</u>	<u>- 8</u>	<u>- 7</u>
9	8	6	6	7
<u>- 8</u>	<u>- 4</u>	<u>- 2</u>	<u>- 3</u>	<u>- 3</u>
10	2	12	15	15
<u>- 10</u>	<u>- 1</u>	<u>– 11</u>	<u>- 5</u>	<u>– 10</u>
14	10	20	9	9
<u>- 7</u>	<u>- 3</u>	<u>– 10</u>	<u>- 9</u>	<u>- 6</u>
8	17	18	18	18
<u>- 7</u>	<u>– 5</u>	<u>- 8</u>	<u>– 9</u>	<u>- 10</u>